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| 09/502,282 | 02/10/2000 | Jerrell P. Hein | 75622.P0015 | 4947 |

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| EXAMINER |
|---|
| TIEU, BINH KIEN |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2643 | 5 |

DATE MAILED: 07/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. 09/502,282 | Applicant(s) HEIN ET AL. | |
|---|---|---|---|
| | Examiner BINH K. TIEU | Art Unit 2643 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *10 February 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,15-27 and 32-36* is/are rejected.

7)☐ Claim(s) *14 and 28-31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2, 3* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhou (U.S. Pat. #: 6,178,241).

Regarding claim 1, Zhou teaches a subscriber loop interface circuit (i.e., line card 308 as shown in figure 3) comprising:

a signal processor (i.e., Digital Signal Processor 304 or DSP 508 shown in figure 5A) having sense inputs for sensed tip signal and a sense ring signal of a subscriber loop (col.5, lines 27-42 and col.6, lines 5-29), wherein the signal processor generates a linefeed driver control signal in response to the sensed signals, wherein the signal processor resides on an integrated circuit die (col.6, lines 34-51).

Regarding claim 2, note col.11, lines 1-18.

3. Claims 5-8, 11-12, 21, 23, 26 and 32-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al. (U.S. Pat. #: 5,881,129).

Regarding claim 5, Chen et al. ("Chen") teaches an apparatus such as customer loop interface circuit shown in figure 1 comprising:

a signal processor (i.e., microprocessor/digital signal processor DSP) generating loop control signals in response to a sensed tip signal and a sensed ring signal of a subscriber loop (DSP generating or issuing control signals such as signals shown in table I and II from col.19 through col.22, col.5, line 65 – col.6, line 24; col.9, lines 37-67; col.10, lines 2-7); and

a linefeed driver portion (i.e., Amplifier AX and Amplifier AR) for driving the subscriber loop in accordance with the subscriber loop control signals, the linefeed driver portion providing the sensed tip and ring signals, wherein each of the linefeed driver portion and the signal processor resides on an integrated circuit die (col.4, line 51 – col.5, line 11; col.5, line 65 – col.6, line 24).

Regarding claim 6, Chen further teaches the Amplifier AX and Amplifier AR both reside on a same integrated circuit die as shown in figure 1.

Regarding claim 7, Chen further teaches the Amplifier AX and Amplifier AR reside on second subassembly as an IC packet at the right-hand side of figure 1 while the other components are in another packet located on the left-hand side of figure 1 (col.3, line 65 through col.4, line 21).

Regarding claim 8, Chen also teaches the first subassembly and second subassembly are integrated into a single circuit package such as the customer loop interface circuit as shown in figure 1.

Regarding claim 11, note col.4, lines 22-50.

Regarding claim 12, note col.8, line 20 – col.9, line 57.

Regarding claim 21, the limitations of the claim are rejected with the same reasons as set forth in the rejection of independent claim 5. Chen further teaches the signal processor including a CODEC as shown in figure 1.

Regarding claim 23, Chen further teaches the linefeed driver such as the subassembly IC in the dash line, as shown in figure 1, does not reside within a same integrated circuit as the signal processor.

Regarding claim 26, note col.4, lines 30-50.

Regarding claims 32 and 33, Chen further teaches the line circuit controlled by the microprocessor/DSP to provide normal BORSCHT functions (see Abstract of the Patent).

Regarding claims 34-36, Chen further teaches limitations of the claim in col.8, line 20 – col.9, line 57.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou (U.S. Pat. #: 6,178,241) in view of Smith (U.S. Pat. #: 4,984,266).

Regarding claim 3, Zhou teaches all subject matter as claimed above, except for the Digital Signal Processor (DSP) integrated circuit 304 in each of line card 308 as shown in figure 3 is a complementary metal oxide semiconductor (CMOS) integrated circuit. However, Smith teaches a subscriber line card arrangement comprising a single CMOS digital signal processor 13 as shown in figures 1 and 2 (see Abstract of the Patent) for performing digital signal processing of the telephone signals in each of the eight multiplexing channels.

Therefore, it would have been obvious to one of ordinary skill in the art the time the invention was made to incorporate the use of the CMOS integrated circuit as a digital processor, as taught by Smith, in view of Zhou in order to perform digital signal processing of the telephone signals in the channels.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou (U.S. Pat. #: 6,178,241) in view of Gay (U.S. Pat. #: 4,609,781).

Regarding claim 4, Zhou teaches all subject matter as claimed above, except for the signal processor calculates common mode and differential mode component of the subscriber loop. However, Gay teaches such features in col.11, lines 37-47 and col.9, lines 16-49 for a purpose of improving transmission and receipt of data signals.

Therefore, it would have been obvious to one of ordinary skill in the art the time the invention was made to incorporate the use of signal processor calculates common mode and differential mode component of the subscriber loop, as taught by Gay, in view of Zhou in order to improve transmission and receipt of data signals.

8. Claims 9 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (U.S. Pat. #: 56,881,129) in view of Smith (U.S. Pat. #: 4,984,266).

Regarding claims 9 and 25, Chen teaches all subject matter as claimed above, except for the Digital Signal Processor (DSP) integrated circuit 304 in each of line card 308 as shown in figure 3 is a complementary metal oxide semiconductor (CMOS) integrated circuit. However, Smith teaches a subscriber line card arrangement comprising a single CMOS digital signal processor 13 as shown in figures 1 and 2 (see Abstract of the Patent) for performing digital signal processing of the telephone signals in each of the eight multiplexing channels.

Therefore, it would have been obvious to one of ordinary skill in the art the time the invention was made to incorporate the use of the CMOS integrated circuit as a digital processor, as taught by Smith, in view of Chen in order to perform digital signal processing of the telephone signals in the channels.

9. Claims 10, 15-20, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Pat. #: 5,881,129) in view of Gay (U.S. Pat. #: 4,609,781).

Regarding claim 10, Chen teaches all subject matter as claimed above, except for the signal processor calculates common mode and differential mode component of the subscriber

loop. However, Gay teaches such features in col.11, lines 37-47 and col.9, lines 16-49 for a purpose of improving transmission and receipt of data signals.

Therefore, it would have been obvious to one of ordinary skill in the art the time the invention was made to incorporate the use of signal processor calculates common mode and differential mode component of the subscriber loop, as taught by Gay, in view of Chen in order to improve transmission and receipt of data signals.

Regarding claim 15, Chen teaches an apparatus such as customer loop interface circuit shown in figure 1 comprising:

a signal processor (i.e., microprocessor/digital signal processor DSP) having sense inputs for a sensed tip signal and a sensed ring signal of a subscriber loop (col.5, line 65 – col.6, line 24; col.9, lines 37-67; col.10, lines 2-7).

It should be noticed that Chen fails to clearly teach the signal processor computing common mode and differential mode components of the subscriber loop. However, Gay teaches such features in col.11, lines 37-47 and col.9, lines 16-49 for a purpose of improving transmission and receipt of data signals.

Therefore, it would have been obvious to one of ordinary skill in the art the time the invention was made to incorporate the use of signal processor calculates common mode and differential mode component of the subscriber loop, as taught by Gay, in view of Chen in order to improve transmission and receipt of data signals.

Regarding claim 16, note col.4, line 51 – col.5, line 11; col.5, line 65 – col.6, line 24.

Regarding claims 17 and 19, Chen further teaches the Amplifier AX and Amplifier AR both reside on a same integrated circuit die as shown in figure 1.

Regarding claim 18, Chen further teaches the Amplifier AX and Amplifier AR reside on second subassembly as an IC packet at the right-hand side of figure 1 while the other components are in another packet located on the left-hand side of figure 1 (col.3, line 65 through col.4, line 21).

Regarding claim 20, Chen also teaches the first subassembly and second subassembly are integrated into a single circuit package such as the customer loop interface circuit as shown in figure 1.

Regarding claims 22 and 24, the limitations of the claims are rejected with the same reasons of the claim 10 above.

10. Claims 13 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Pat. #: 5,881,129) in view of Zhou (U.S. Pat. #: 6,178,241).

Regarding claims 13 and 27, Chen teaches all subject matters as claimed above, except for the features of sensed tip signal comprising first and second tip voltages, wherein a difference between the first and second sensed tip voltages is proportional to the tip current, wherein the sensed ring signal includes first and second sensed ring voltages, wherein a difference between the first and second sensed tip voltages is proportional to the ring current. However, Zhou teaches such features in col.11, lines 1-18 for a purpose of detecting on-hook and off-hook states of subscriber line.

Therefore, it would have been obvious to one of ordinary skill in the art the time the invention was made to incorporate the use of the features of sensed tip signal comprising first and second tip voltages, wherein a difference between the first and second sensed tip voltages is

proportional to the tip current, wherein the sensed ring signal includes first and second sensed ring voltages, wherein a difference between the first and second sensed tip voltages is proportional to the ring current, taught by Zhou, into view of Chen in order to improve the line card with the detection features of subscriber loop status.

***Allowable Subject Matter***

**11.** Claims 14, 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh K. Tieu whose telephone number is (703) 305-3963 and E-mail address: BINH.TIEU@USPTO.GOV.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Curtis Kuntz, can be reached on (703) 305-4708 and **IF PAPER HAS BEEN MISSED FROM THIS OFFICIAL ACTION PACKAGE, PLEASE CALL Customer Service at (703) 306-0377 FOR THE SUBSTITUTIONS OR COPIES**.

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BINH TIEU
PRIMARY EXAMINER
Art Unit 2643

Date: July 13, 2003